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OCCUPATIONAL EXPOSURE INCIDENTS IN CALIFORNIA
IN 1975 INVOLVING METHYL PARATHION

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SUMMARY

There were six occupational human illnesses in 1975 in California that were attributed by physicians as being due to exposure to methyl parathion. This pesticide has the potential for causing serious illness and death if misused. The illnesses that occurred were due to a variety of causes. Treatment and recovery were satisfactory. The causes of exposure were so varied that only the general precaution of carefully following the label is recommended as a guide to avoid the types of exposures which occurred.

General Information on Methyl Parathion

Chemical Name: O,O-Dimethyl-O-p-nitrophenyl phosphorothioate.

Common Names: Methyl parathion, parathion-methyl (ISO, BSI), metaphos (USSR).

Trade Names: Dalf, Folidol M, Fosferno M50, Gearphos, Metacide 50, Metron, Nitrox 80, Pastron M, Tekwaisa, Wofatox.

Other Names: Dimethyl parathion, E601.

Chemical Properties: Methyl parathion is an organophosphate which is soluble in most organic solvents, slightly soluble in aliphatic hydrocarbons and is particularly insoluble in water. The specific gravity is $d_{20^{\circ}/4^{\circ}\text{C}} = 1.36$.

General Information on Specific Products Known to Cause Human Injuries in 1975:

Coastox Methyl Parathion (Coastal Ag-Chem; EPA Reg. No. 08469-50084-AA); formulation: 4 Emulsifiable (4 lbs/gal).

Red Top Ethyl-Methyl Parathion (Wilbur-Ellis; EPA Reg. No. 02935-00360-AA); formulation: 6-3 spray (6 lbs. parathion and 3 lbs. methyl parathion per gallon).

Niagara Methyl Parathion 1.0, Thiodan 1.0, Toxaphene 4.0 EC (FMC Corp. - Agricultural Chemicals Division; EPA Reg. No. 00279-50222-AA).

Prokil Ethyl-Methyl Parathion 6-3E (The Dune Company; EPA Reg. No. 10163-00003-AA).

BAC E-M Parathion 6-3 (Bakersfield Ag Chem, Inc.; Reg. No. 11369-50017-AA)1 formulation: 6 lbs. ethyl parathion and 3 lbs. methyl parathion/gallon.

Action: Cholinesterase inhibiting insecticide

Application: It is commonly applied at rates of 1-3 lbs/acre for the control of many insects of economic importance. In 1975, approximately one half million pounds of methyl parathion were applied in California (see Table 1). Of this, a large portion was applied to artichokes, alfalfa, lettuce, rice, sugarbeets, and tomatoes.

Combinations: Methyl parathion may be used with most other pesticides excluding alkaline materials. It is often combined with ethyl parathion or purchased as a mixture of the two.

Toxicity Data: LD₅₀ acute, oral, rat: Male = 14 mg/kg
Female = 24 mg/kg

LD₅₀ acute, dermal, rabbit: Male and Female = 67 mg/kg

Toxicity Category: Methyl parathion products are in toxicity category one (1), with the exception of the microencapsulated products which are in toxicity category two (2).

Uses of Methyl Parathion in California During 1975 - Table attached.

Other Pesticides Associated with Methyl Parathion in Human Illness Cases Reported in 1975

Lannate, Phosdrin	- 1
Lannate	- 1
Ethyl Parathion	- 3
Manzate	- 1
Thiodan, Toxaphene	- 1

Causes of Illness

There were two nonagricultural worker illnesses.

A checker-loader in a warehouse became lightheaded and nauseated while transferring barrels of methyl parathion. The worker had been working for about 15 minutes when he began to feel ill and went to the doctor as a safety precaution. There is a possibility he was exposed to fumes, but the physical examination was essentially normal. No cholinesterase tests were taken. No hospitalization was required and one to three days of work were missed.

A salesman was exposed to a mixture of ethyl-methyl parathion which may have caused systemic illness. He was delivering a glass jug of the pesticide when it broke and spilled on the truck and on him. He was later cited for improperly disposing of the bottle and the spilled contents. His cholinesterase test showed that his enzyme level was within the normal limits. The symptoms he exhibited were dizziness and slight nausea. The patient had been having legal problems and was diagnosed by the doctor as suffering from anxiety and tension. One day of work was missed.

The following cases involved agricultural employees. None of the illnesses were attributed to exposure to methyl parathion alone.

A field worker was employed by the owner of a small acreage of floral ornamentals. On the day the injury occurred, a mixture of methyl parathion 1.0, Thiodan 1.0, and Toxaphene 4.0 EC was sprayed on the ornamentals. All the employees were working in a hot house protected from the spray. Later one of the workers went to a nearby field of cucumbers and ate one without washing it. He experienced severe stomach cramps, nausea and vomiting within a short time. The duration of his hospital stay was two days, and three to five days of work were lost. This type of incident can be prevented by cautioning workers about eating produce which may have been exposed to pesticides.

Methyl parathion, used in conjunction with Lannate, was involved in a ground applicator's illness. Apparently he had been spraying celery with the pesticides methyl parathion, Lannate, Phosdrin and Monitor. After about a week, his cholinesterase enzyme levels dropped and he was relieved of working with organophosphate and carbamate type pesticides. About a week and a half later he developed nausea, headaches, and vomiting. All required safety equipment, which included respirator and rubber boots and gloves, were provided and used. However, the patient had long hair which possibly absorbed the spray. In addition, he did not always shower each day after work, which may have contributed to his illness.

A mixer-loader for an aerial applicator became ill after working about four days with Lannate, Phosdrin and ethyl-methyl parathion. The worker had several symptoms, the major ones being vomiting, dizziness and weakness. All required protective clothing was worn and normal safety precautions taken. The illness may have been complicated by the patient's anemia and ulcers. He was hospitalized for one day.

An irrigator received a skin injury as a result of exposure to E-M parathion and Manzate. A rash had broken out on the worker while he was in an onion field where the two pesticides had been used several times during the previous three weeks. Cholinesterase tests showed the enzyme levels were abnormally low when the first examination was done and within the lower limits five weeks later. Method of exposure was not determined.

Table 1
State of California
Department of Food and Agriculture

P E S T I C I D E U S E R E P O R T
METHYL PARATHION USED IN 1975

CHEMICAL COMMODITY CROP	APPS.	POUNDS	ACRES
METHYL PARATHION			
Agencies, Other		5.80	
Alfalfa	567	23,240.85	54,750.60
Apple	2	52.49	70.00
Artichoke	2,816	137,622.41	158,628.00
*-u- Artichoke	1	5.00	113.00
Barley	164	7,320.75	32,508.00
Beans	181	9,792.15	14,047.50
-u- Beans	1	1.74	20.00
Beets	212	7,657.45	16,433.50
Broccoli	62	1,020.33	2,491.20
Brussels Sprouts	40	1,199.33	1,470.50
Cabbage	87	764.05	1,455.50
Carrot	198	4,207.72	7,229.00
Cauliflower	76	755.30	1,536.00
Celery	524	7,124.92	8,819.23
Collard	1	8.25	22.00
Corn	105	2,598.47	7,850.00
Cotton	1,018	57,988.98	111,080.50
Cucumber	1	5.25	21.00
Flowers	3	23.88	20.00
Grapes	12	519.05	660.60
Lettuce (Head)	3,000	56,780.64	128,573.08
-u- Lettuce (Head)	1	.75	15.00
Lettuce (Leaf)	36	245.60	401.00
Melons	8	69.60	466.00
Oats	1	28.12	30.00
Onions	181	5,820.44	12,519.57
Ornamentals	29	371.18	474.00
Peach	10	359.43	462.00
Peas	7	161.41	594.60
Peppers (Bell)	30	519.49	781.50
Peppers (Chili)	1	8.06	8.00
Potato	152	3,903.21	5,567.68
-u- Potato	1	.50	24.00
Prune	3	101.97	136.00
Residential pest Control		.50	
Rice	299	23,461.28	36,687.55
Safflower	1	32.63	75.00
Sorghum	27	850.07	2,140.00
Spinach	14	525.32	1,265.00
Strawberries	4	170.25	227.00
Sugarbeet	2,492	55,772.11	195,705.09
Sunflower	2	398.40	425.00
Tomato	852	48,856.14	71,413.15
-u- Tomato	1	.83	6.00
Turnip	6	30.99	46.50
Vector Control		24,205.58	
Wheat	180	9,126.37	27,222.50
TOTAL	13,404	496,305.20	904,313.35

* The letter -u- is used to designate a unit of measure that is not acres;
these numbers are not added for the total.